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Section 6 - Interoperable Communications Equipment

Overview

This section lists equipment and systems that provide communications functionality, connectivity, and interoperability between local agencies and other organizations. The items mentioned serve to develop situational awareness and better coordinate response operations for CBRNE terrorism and homeland security operations.

Like the previous edition, the Spring 2006 SEL has divided information technology, cyber security and communications into three distinct sections (Sections 4, 5, and 6 respectively). While there continues to be a close connection among the three (and even some merging of technologies such as voice communications over the Internet), the separation of sections should make it easier to locate desired equipment items. This year's SEL also continues the practice of providing information on desirable features, operating limitations, and standards (where applicable). These fields are designed to enhance the reader's understanding of the defined items and their practical use.

Online Selection Factors

Like most sections in the 2006 SEL, the online[1] version of the Communications Section (in the Responder Knowledge Base, www.rkb.mipt.org) uses a pair of selection factors to assist users in quickly identifying appropriate equipment items. For this section, the SubGroup chose User Level and Use Location (described below) as the two factors. Every online item is "tagged" for each appropriate combination of factors. Thus users of the online version can choose any combination of User Level and Use Location, and the system will provide a list of all items tagged for that combination.

The User Levels for communications equipment are defined as follows:

End User	Users who possess no special training or other qualifications with respect to the equipment being utilized. Examples would be users of cellular telephones or 2-way transceivers.
Communications Technician	Users who possess some specialized training or other qualifications with respect to the equipment being utilized. Examples would be users who have attended classroom training for a telephone switch, or who have received training in hardware installation and setup.
Communications Advanced Technician	Users who possess some extensive training or career-level qualifications with respect to the equipment being utilized. Examples would be trained satellite communications professionals capable of setting up and operating complex base stations.

The probable Use Location(s) are defined as follows:

Rear Information Zone - Strategic	Emergency Operations Center/ Joint Operations Center Intel Support.
Rear Information Zone - Operational	Emergency Operations Center/ Departmental Operations Center Intel Support.
Forward Information Zone - Support [Cold]	Incident Command Post Intel Support; near incident scene, but in cold zone.

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[1] *The on-line version is available on the Responder Knowledge Base, www.rkb.mipt.org.*

Forward Information Zone - Contamination Reduction [Warm]	Operations/Intel Support in warm zone.
Forward Information Zone - Exclusion [Hot]	Operations/Intel Support in hot zone.

The above two factors provide a method for classifying equipment items. For example, satellite equipment is classified as requiring at least a Communications Technician to install and configure, and might be used in the Rear Information Zone or the Forward Information Zone - Support [Cold], but would probably not be used in either the Warm or Hot zones. In the online SEL, if a user selected "Communications Technician" and "Rear Information Zone" as the two desired selection factor values, satellite equipment would then appear in the search results along with any other equipment recommended for that combination.

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Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CC - Commercial 01 - Cell, Digital			
06CC-01-CELL Phone, Cellular	Digital cellular phone	Locator / Phase II compliant. Wireless Priority Service (WPS) enabled. -- Check coverage area. WPS is only available w/GSM. Check availability of digital service in your area. Ongoing service costs. Cell phone cameras don't currently have high enough resolutions for legal purposes. Some brands of phones can be tracked via location software.	
CC - Commercial 02 - Data & Messaging			
06CC-02-2WAY Device, Messaging, 2-Way Text	Text messaging device with 2-way capability.	Some devices have Internet capability. Some devices also function as cell phones and/or wireless modems. -- Consider service area in vendor selection. Examine billing plan parameters.	
06CC-02-DSAD Device, Data Service Access	PCMCIA card, serial device, or USB device for access to on-line data services.	Multiple protocols available such as General Packet Radio Service (GPRS), CDMA, TDMA. -- Consider coverage area. Examine billing plan parameters.	
06CC-02-PAGE Paging	Paging services, 1-way text messaging.	Audible or silent alarm -- Consider coverage area. Examine billing plan. Consider capacity (# of characters).	

[1] *Use numbers given to refer to Standards List at the end of this document.*

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Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CC - Commercial 03 - Satellite Phone			
06CC-03-SATB Phone, Satellite Base	Satellite communication device, fixed location.	Operation similar to cell phone. Used in a fixed location. -- Consider cost(s) of service. Line of sight to satellite (outside antenna) required.	
06CC-03-SATM Phone, Satellite Mobile	Satellite communication device, mobile.	Fixed or vehicle configuration. Cell-type service. -- Line of sight to satellite (outside antenna) required. Consider cost(s) of service.	
06CC-03-SATP Phone, Satellite Portable	Satellite service with handheld device.	Operation similar to cell phone. -- Line of sight to satellite (outside antenna) required. In-building/car kits are available for portable satellite phones. Service costs/fees.	
CC - Commercial 04 - Satellite Data Services			
06CC-04-EQSD Equipment, Satellite Data	Satellite earth station transmitter and receiver, usually Ku-Band.	Annual or multi-year leased capacity. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. -- 24x7x365 Availability. Fixed site (stationary and transportable). Two end points required. May require FCC license. Service costs questions should be directed to ODP.	

[1] *Use numbers given to refer to Standards List at the end of this document.*

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Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CC - Commercial 04 - Satellite Data Services - *Continued*			
06CC-04-INST INMARSAT - B	INMARSAT - B Satellite communications equipment.	No license necessary. Similar to cell service. Monthly access charges with per minute charges. 64-Kbps channels. --- Line of sight to satellite (outside antenna) required. Supports video phone. Data links should be able to support VOIP.	
06CC-04-SADS Services, Satellite Data	Satellite Data Services (Internet access via satellite connection). Commercial providers of Internet connectivity via satellite.	Stationary operation, transportable. Includes Ku (most often) and L band. --- Fixed site (stationary and transportable). Line of sight to satellite (outside antenna) required. Ka satellite service not readily available yet.	
06CC-04-SSBR Services, Satellite, Brokered	Full service rental/lease of satellite transponder time, including truck and technicians.	Purchase as needed. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. --- Fixed site (stationary and transportable). Two end points required. Very high bandwidth available.	
06CC-04-SSFT Space Segment, Full Time, Leased	Satellite transponder time purchased on long term contracts.	Annual or multi-year leased capacity. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. --- 24x7x365 Availability. →	

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Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CC - Commercial 04 - Satellite Data Services - *Continued*			
		Fixed site (stationary and transportable). Two end points required. May require FCC license. Service cost questions should be directed to ODP.	
06CC-04-SSHB Space Segment, Hourly, Brokered	Satellite transponder time purchased by the hour.	Purchase as needed. 50KHz to 70MHz bandwidth. Single audio or low-speed data up to multiple T-1 capacity. -- Stationary site - Transportable Service. Two end points required. Service cost questions should be directed to ODP.	
CC - Commercial 05 - Priority Services			
06CC-05-PRTY Priority Services, Communications	Services to ensure priority communication over common carrier media, such as cellular phones or telephone land lines. Includes Government Emergency Telecommunications Service (GETS); NCS Telecommunications Service Priority (TSP) Program; and NCS Wireless Priority Services (WPS).		

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Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CP - Private 01 - Land-Mobile Radios & Bases			
06CP-01-BASE Radio, Base	Base radio system	Digital and analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional and/or trunked systems. Project 25 compatible (if w/in 800 MHz). Project 25 required w/in 700MHz. -- Consider installation needs: grounding, location, lightning protection.	60
06CP-01-HFRQ Radio, High Frequency (HF) Single Sideband	High Frequency (HF) Single Sideband communications equipment.	Deployable antenna systems. Automatic Link Establishment (ALE). Automatic email option available. -- Long range communication. May require large antenna system (65 feet typical). Special knowledge area - beyond most common user level training.	
06CP-01-MOBL Radio, Mobile	Mobile radio equipment, deployed in vehicles or can also be deployed as 'temporary' base stations.	Digital and analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional and/or trunked systems. Project 25 compatible (800 MHz). Project 25 required (700MHz). -- See 47 CFR 90 FCC for applicable standard. When utilizing as a 'temporary' base station, consider programming needs and capabilities.	60
06CP-01-PORT Radio, Portable	Individual/portable radio transceivers	Digital and analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional systems. Project 25 compatible (800 MHz). →	60

[1] *Use numbers given to refer to Standards List at the end of this document.*

Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CP - Private 01 - Land-Mobile Radios & Bases - *Continued*			
		Project 25 required (700MHz). --- See 47 CFR 90 FCC for applicable standard. Portable radios may not be advisable in EOD operations - consider hard-line, or other solutions. Can be intrinsically safe.	
06CP-01-REPT Repeaters	Repeaters	Digital or analog capable. Supports 25Khz and 12.5Khz channels. Supports conventional or trunked systems. Project 25 compatible (800 MHz). Project 25 required w/in 700MHz. Portable and/or Fixed. Able to pass encryption transparently. --- Could be configured for cross-band operations. Consider installation needs: grounding, location, lightning protection.	
06CP-01-TOWR Systems, Antenna and Tower	Fixed and Portable	May include omnidirectional antennae. --- Should be constructed with consideration for potential hazards (such as hurricanes, floods, tornadoes, forest fires, etc.). All public safety towers must meet current EIA standards for the climates in which they operate. Towers should have engineering inspections to ensure that the tower has not been overloaded with too much equipment for the wind loading expected.	

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Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CP - Private 02 - Bridging/Patching/Gateway Equipment			
06CP-02-BRDG Equipment, Bridging/ Patching/Gateway	Includes a wide range of equipment and software utilized to connect disparate communications networks. Systems range from cords that can patch two radios to interface boxes that can link dozens of radios, phones, computers, etc. in multiple sessions.	Hard-wired and/or software-definable. Connects multiple radios/devices together for voice and/or data. Supports transmit/receive devices (radio, telephone, VoIP). Devices can be as small as a link between two specific devices or as large as infrastructure support systems. -- Careful consideration must be given to how channels are interconnected. A significant knowledge of the systems to be linked is required. Mistakes in patching or bridging can bring down both systems. There are significant use policy implications with the operation of these systems. Consider licensing issues for individual system, as well as possible licensing implications from linking them.	
CP - Private 03 - Other Land-Mobile Radio Equipment			
06CP-03-BAMP Amplifiers, Bi-directional	Bi-directional Amplifiers, application defined.	May be passive or active. -- Used to extend cell phone or radio signals into/out of buildings, tunnels, underground.	
06CP-03-ICOM Intercom	Systems for hands-free (wired or wireless) communication for limited numbers of personnel in close proximity, such as vehicle crew members.	Voice activated, full duplex. May be battery powered or use vehicle power. -- For battery units, vehicle adapter is useful. Wireless units will have low power, and should not be used in lieu of handheld radios over distances beyond their design limits.	

[1] *Use numbers given to refer to Standards List at the end of this document.*

Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CP - Private 03 - Other Land-Mobile Radio Equipment - *Continued*			
06CP-03-MWAV Radio, Microwave Link	Microwave link for remote control of radio base stations or for temporary links at event sites.	May be either license-free or exclusive use license. -- Line of sight required. Available in licensed and un-licensed bands.	
06CP-03-NRSC Cable, Non-radiation Shielded Transmission	Non-radiation shielded transmission cable be-tween base/repeater and antenna.		
06CP-03-PRAC Accessories, Portable Radio	Speaker/microphone extensions to portable radios. Sometimes used within encapsulated/par-tially encapsulated suits, where restricted access to radio equipment impedes normal portable radio operations.	May rely on Push-To-Talk (PTT) or Voice Activation (VOX) for keying microphone. May include bone microphones, throat microphones, etc. -- May include intrinsically safe equipment.	
CP - Private 04 - Wide Area Networks			
06CP-04-WADN Network, Wide Area Digital	Wide area digital network, voice/data capable.	>10MBPS data transmission speeds -- Network security.	

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Item Number/Title	Description	Features/Operating Considerations	Standards[1]
CP - Private 05 - Wire-Line Communication			
06CP-05-BRAC Bridge, Audio Teleconferencing	Device to connect more than 2 parties (up to many dozens) into a single audio conference.	-- Encryption needs and impacts on overhead must be considered.	
06CP-05-LPBX Exchange, Private Branch, Portable	Portable Private Branch Exchange (PBX)	Many modern PBXs are VoIP platforms. -- Installation may be expedited by Telecommunications Service Prioritization (TSP) through State Emergency Management Office. Required to have pass-through/addressable phone locations for permanent installations.	
06CP-05-VCNB Bridge, Video Teleconferencing	Device to connect more than 4 parties (up to many dozens) into a single video conference.	May connect users via ISDN, Internet, dedicated broadband. May be encrypted. -- Extremely high price (>$100K). Encryption needs and impacts on overhead must be considered.	
06CP-05-VCON Teleconferencing, Video	Video teleconferencing over ISDN telephone lines or broadband facilities.	-- Minimum 256KB bi-directional bandwidth required. Encryption needs and impacts on overhead must be considered.	

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